SECTION 07 71 00
ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof-edge specialties.

B. Roof-edge drainage systems.

C. Reglets and counterflashings.

D. Wall sheet metal fabrications.

1.02 RELATED REQUIREMENTS

A. The Contract Documents include: the "Contract Drawings"; the "Specifications"; the "Special Notice to Contractors", "Special Conditions", NYC Housing Authority Contracts", latest edition; the "Form of Proposal", "Form of Bid Bond", and all amendments and addenda, all of which govern the work of this Contract.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

C. Section 07 14 00 - Cold Fluid Applied Reinforced Roofing.

1.03 SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Retain "Shop Drawings" Paragraph below for Work that involves custom fabrication or if manufacturer's product data are inadequate.

C. Retain "Samples" Paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

D. Samples: For each type of roof specialty specified.
   1. Retain subparagraph below when necessary to verify fabrication techniques in absence of a mock-up requirement.
   2. Include roof-edge specialties made from 12-inch (300-mm) lengths of full-size components in specified material, and including fasteners, cover joints, accessories, and attachments.

E. Qualification Data: For manufacturer.

F. Retain "Product Certificates" Paragraph below to require submittal of product certificates from manufacturers.

G. Retain "Product Certificates" and "Product Test Reports" paragraphs below for each type of roof specialty if applicable.

H. Product Certificates: For each type of roof specialty.

I. Product Test Reports: For roof-edge flashings, for tests performed by a qualified testing agency.

J. Sample Warranty: For manufacturer's special warranty.

K. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class and SPRI ES-1 tested to specified design pressure.
   1. Retain "Source Limitations" Paragraph below if required for Project. Coordinate with "Warranty" Article of this Section and requirements of Project roofing-membrane Section.

2. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty specified in Section 07 14 00 "Cold Fluid Applied Reinforced Roofing".

1.05 PRE-INSTALLATION CONFERENCE

A. Meet with Authority Representative, Architect, roofing-system testing and inspecting agency representative, roofing Installer, roofing-system manufacturer's representative, Installer, structural-support Installer, and installers whose work interfaces with or affects roof specialties, including installers of roofing materials and accessories.

B. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.

C. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.06 DELIVERY, STORAGE AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.07 FIELD CONDITIONS

A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.

B. Coordination: Coordinate roof specialties with flashing, trim, and construction of roof deck, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.08 WARRANTY

A. A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 07 14 00 "Cold Fluid Applied Reinforced Roofing".

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. Retain "FM Approvals' Listing" Paragraph below if Project is FM Global insured or if FM Approvals' requirements set a minimum quality standard. Coordinate requirements of FM Approvals' classification with other requirements in this Section. Verify availability of copings or roof-edge specialties with these classifications.

C. FM Approvals' Listing: Manufacture and install copings and roof-edge specialties that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with FM Approvals' markings.

D. Retain "SPRI Wind Design Standard" Paragraph below if Project is governed by the International Building Code (IBC) or if SPRI ES-1 sets a minimum quality standard. Coordinate requirements in SPRI ES-1 with other requirements in this Section. Verify availability of copings or roof-edge specialties that meet these requirements. See Evaluations for additional information on SPRI ES-1 testing programs.

E. ANSI/SPRI Wind Design Standard: Manufacture and install copings, fascias, sumps, cap flashings and roof-edge specialties of stainless steel and each location’s specific profile shall be tested and certified for ANSI/SPRI ES-1 wind resistance for 110 mph.

F. Indicate wind design pressure on Drawings or in "Design Pressure" Subparagraph below. Design pressure is determined by formulas in the IBC or SPRI ES-1, as applicable, that account for basic wind speed, exposure factor, building height, building importance factor, and pressure coefficient that incorporates a gust factor.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.02 MANUFACTURERS

A. Manufacturers <http://www.specagent.com/LookUp/?ulid=7585&mf=04&src=wd>: Subject to compliance with requirements, provide products by the following:
   1. Metal-Era, Inc
   2. B&B Sheet Metal
   3. W.P. Hickman Systems, Inc

2.03 COMPONENTS

A. Roof-Edge Specialties
   1. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet (3.6 m) and a continuous metal receiver with integral drip-edge cleat to engage fascia cover and secure roof membrane. Provide matching corner units.
   2. Retain "Metallic-Coated Steel Sheet Fascia Covers" or "Formed Aluminum Sheet Fascia Covers" Subparagraph below. Retain thickness of fascia cover that meets performance requirements and has the rigidity to suit Project.
   3. Stainless-Steel Sheet Fascia Covers: Stainless-steel, minimum 18 gauge and thickness as required to meet performance requirements.
   4. Some manufacturers do not offer first two options in "Corners" Subparagraph below; if required, verify availability with manufacturers.
   5. Corners: Factory mitered and soldered or continuously welded.
   6. Scuppers separate from roof-edge specialties are specified in "Roof-Edge Drainage Systems" Article.
   7. Fascia Specialty Accessories: Pre-fabricated sump assembly for downspout water removal. Welded stain-less steel core-box with fascia cove and mesh strainer screen.
   8. Fascia Accessories: Overflow scupper and mesh strainer screen.
   9. One-Piece Gravel Stops: Manufactured, one-piece, metal gravel stop in section lengths not exceeding 12 feet (3.6 m), with a horizontal flange and vertical leg fascia terminating in a drip edge, and concealed splice plates of same material, finish, and shape as gravel stop. Provide matching corner units.
      a. Formed Stainless-Steel Sheet Gravel Stops: Stainless-steel sheet, minimum 24 gauge and thickness as required to meet performance requirements
      b. Stainless-steel finishes are often not indicated in manufacturers' catalogs; verify availability with manufacturers before retaining a numbered finish.
   10. Some manufacturers do not offer first two options in "Corners" Subparagraph below; if required, verify availability with manufacturers.
      a. Corners: Factory mitered and soldered or continuously welded.

B. Roof-Edge Drainage Systems
   1. Downspouts: Corrugated round complete with mitered elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, leaf screens, and anchors.
      a. Stainless Steel: Minimum 26 gauge.
   2. Manufacturers offer a variety of scupper configurations. Parapet scuppers, which are installed in parapet wall, discharge into conductor heads or, as overflow scuppers, merely project through the parapet. Scuppers combined with roof-edge specialties and discharging into gutters or conductor heads are specified in "Roof-Edge Specialties" Article.

3. Manufacturers offer a variety of conductor-head designs. If a highly ornamental conductor head is required, show details on Drawings or insert manufacturer's name and model number as a basis of design.
4. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout, exterior flange trim, and built-in overflow.
    a. Stainless Steel: Minimum 26 gauge.
5. Manufacturers generally do not show metal splash pans in catalogs; other materials are often used. Retain "Splash Pans" Paragraph below if required, and detail splash pans on Drawings unless included in Section 076200 "Sheet Metal Flashing and Trim."
6. Splash Pans: Fabricate from the following exposed metal:
    a. Stainless Steel: Minimum 20 gauge.
7. Splash Blocks: Precast concrete splash blocks (downspout splash guards) as indicated on the drawings.

C. Reglets and Counterflashings
1. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
    a. Stainless Steel: Minimum 24 gauge
2. Coordinate "Counterflashings" Paragraph below with sheet metal through-wall flashing (with snaplock receiver to receive counterflashing), specified in either Section 042000 "Unit Masonry" or Section 076200 "Sheet Metal Flashing and Trim." Revise paragraph if one-piece counterflashings are required; see Evaluations.
3. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches (100 mm) and in lengths not exceeding 12 feet (3.6 m) designed to snap into reglets or through-wall-flashing receiver and compress against base flashings with joints lapped, from the following exposed metal:
    a. Stainless Steel: Minimum 24 gauge
4. Accessories:
    a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
    b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

D. Manufactured Sheet Metal Flashing and Trim
1. Through-Wall, Sheet Metal Flashing: Manufacture through-wall sheet metal flashing for embedment in masonry, with ribs at 3-inch (75-mm) intervals along length of flashing to provide integral mortar bond. Manufacture through-wall flashing.
    a. Retain "Copper" or "Stainless Steel" Subparagraph below, or delete both and insert requirements for aluminum, zinc-tin alloy-coated stainless steel, or zinc-tin alloy-coated copper if available.
    b. Stainless Steel: Minimum 22 gauge

E. Underlayment Materials
1. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils (0.76 to 1.0 mm) thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
    a. Thermal Stability: ASTM D 1970/D 1970M; stable after testing at 240 deg F (116 deg C).
    b. Low-Temperature Flexibility: ASTM D 1970/D 1970M; passes after testing at minus 20 deg F (29 deg C).
2. Type II (No. 30) felt or self-adhering sheet underlayment is generally used over wood blocking or sheathing when air- and moisture-tight construction is not required; verify need with roof-specialty manufacturer.
3. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

4. Slip sheet in "Slip Sheet" Paragraph below is often used over other types of underlayment materials and may be required over a felt underlayment; verify need with roof-specialty manufacturer.
5. Slip Sheet: Rosin-sized building paper, 3-lb/100 sq. ft. (0.16-kg/sq. m) minimum.

F. Miscellaneous Materials
1. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
2. Retain applicable subparagraphs below and revise to suit Project.
3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
4. Revise "Elastomeric Sealant" Paragraph below if sealant of specific type, grade, class, and use is required.
5. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.
6. Retain "Butyl Sealant" Paragraph below for concealed sealant use in metal joints with limited movement.
7. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.
8. Solder:
   a. Retain applicable materials in five subparagraphs below. Soldering requires removal of painted, coated, or lacquered finishes.
9. Although the EPA has no regulations restricting lead used for sheet metal flashing and trim, state and local restrictions and public-opinion concerns may exist. OSHA has restrictions that apply to workers using lead. Revise solder compositions below if required. Solder compositions with maximum lead content of 0.2 percent may be less preferred and are usually more expensive but are considered to be "lead free" by ASTM B 32; verify, with sheet metal manufacturer, the acceptability of low-lead-content solder before retaining.
   a. For Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

2.04 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Concealed Surface Finish: Apply pretreatment and manufacturer's standard acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and roof deck for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Installation, General
1. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

a. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
b. Provide uniform, neat seams with minimum exposure of solder and sealant.
c. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
d. Torch cutting of roof specialties is not permitted.
e. Retain subparagraph below if required to prevent galvanic corrosion between graphite and aluminum. See discussion on galvanic scale in the Evaluations.
f. Do not use graphite pencils to mark metal surfaces.

2. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
a. Coat concealed side of stainless-steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
b. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

3. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
a. Space movement joints at a maximum of 12 feet (3.6 m) with no joints within 18 inches (450 mm) of corners or intersections unless otherwise indicated on Drawings.
b. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

4. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
5. Seal concealed joints with sealant as required by roofing-specialty manufacturer.
6. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F (4 deg C).
7. Retain "Soldered Joints" Paragraph below if required for copper components; verify with manufacturers. Insert soldering for other metals to suit Project. See "Seaming and Fastening" Article in the Evaluations.
8. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

B. Underlayment Installation
1. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches (152 mm) staggered 24 inches (610 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.
a. Retain one of or both subparagraphs below.
b. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent roofing materials.

2. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).
3. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

C. Roof-Edge Installation Specialties Installation
1. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
2. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

D. Roof-Edge Drainage System Installation

1. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.
2. Retain last option in "Gutters" Paragraph below if soldering the joints and ends of copper gutters.
3. Revise "Downspouts" Paragraph below if chain downspouts are required.
4. Downspouts: Join sections with manufacturer's standard joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c.
   a. Retain one of two subparagraphs below.
   b. Provide elbows at base of downspouts to direct water away from building walls.
5. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in sealant.
6. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch (25 mm) below discharge.

E. Reglet and Counterflashing Installation
   1. General: Coordinate installation of reglets and counterflashings with installation of base flashings.

F. Wall Flashing Installation
   1. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

G. Miscellaneous Flashing Installation
   1. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with sealant to equipment support member.

3.03 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION